For More Information

Contact:

Secretariat
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The Canada Committee on Ecological Land Classification is a national forum for information exchange on ELS and has representatives from all provinces and territories, from universities and private industry, and from several federal agencies. The Secretariat can answer your questions directly or give you names and addresses of experts in your region.

As well, the Lands Directorate has staff in several regional offices who can provide information on ELS.

- Lands Directorate Atlantic Region
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  Dartmouth, Nova Scotia B2Y 2N6
  Tel: (902) 426-4196
- Lands Directorate Quebec Region
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  Ste. Foy, Quebec G1V 4H5
  Tel: (418) 694-3964
- Lands Directorate Ontario Region
  Environment Canada
  Box 5050
  Burlington, Ontario L7R 4A6
  Tel: (416) 637-4551
- Lands Directorate Pacific and Yukon Region
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Ecological Land Survey (ELS)

Ecological Land Survey combines several disciplines to describe ecosystems and their components, including landforms, soils, vegetation, water and wildlife. It is a comprehensive approach to collecting and organizing information on the stable and dynamic properties of an area.

By examining ecosystems at various levels, ELS provides low-cost general data for large-scale planning, and detailed information for specific applications, such as park management, site selection or impact assessment. With its emphasis on ecosystems, ELS also draws together results from previous sectorial surveys.

Using new or existing data, at whatever level, this holistic approach can answer many concerns of resource managers and planners.

Some Uses of ELS Data

Agriculture
- soil capability for crops
- management problems
- erosion risks

Forestry
- potential productivity
- windthrow risk
- trafficability

Outdoor Recreation
- landscape aesthetics
- exceptional features
- sportfish potential

Wildlife
- land capability for moose
- land capability for waterfowl nesting
- land suitability for birds of prey

Rivers and Streams
- risks of bank erosion
- potential spawning areas
- tolerance to increased flow

Lakes
- potential productivity
- tolerance to phosphates
- shoreline stability

Engineering
- aggregate materials
- septic field tolerance
- stream crossings

and many others . . . . . .

Users of ELS

Federal, provincial and territorial governments and agencies use ELS data in regional planning; selecting sites for development areas, towns and processing facilities; issuing land use permits in the north; developing park management plans; and assessing regional sensitivity to acid precipitation. Public and private corporations also apply ELS to tasks such as marine facility siting, timber lease management, impact assessment, and planning of hydro developments.

The ELS Process

Ecological Land Survey has three phases, described below. While each of these requires a different degree of effort, they are equally important to a successful survey; in some cases the ELS team may also recommend supplementary surveys.

Survey Proposal

The first stage of an ELS involves consultations between the proponents and the survey team to establish objectives, terms of reference, budget, time and manpower constraints. For example, the anticipated uses and users may determine the format of the report (illustrated maps or computerized information) or the inclusion of certain areas studied in greater detail.

Ecological Land Classification

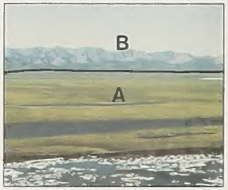
This is the data-gathering phase of an ELS and can be conducted at one or more levels of detail. Ecological land classification is itself usually conducted in three steps. First is prefield preparation, including interpretation of remote sensing imagery to determine the boundaries and probable nature of ecosystems. Field work is then conducted to establish ground reference data, determine ecological processes and generally help explain the imagery to the photo-interpreter. Finally, each ecosystem is coded for selected parameters, and a descriptive text is often added for each ecosystem.

Ecological Land Evaluation

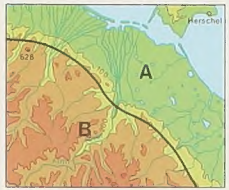
This is the phase of synthesis the ecological information. Ideally, the survey team and the proponents cooperate to develop interpretations, assessments and recommendations which take full account of environmental restrictions and opportunities, as well as keeping the development requirements and economic benefits in mind.

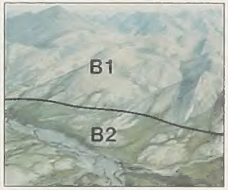
A Hierarchic Approach to Resource Information

Ecological land classification is hierarchic; it can be conducted at one or more levels, ranging from broad ecoregions to ecodistricts, ecosections, ecosites and ecoelements, the most detailed level. The first three are illustrated below, using examples from the northern Yukon.

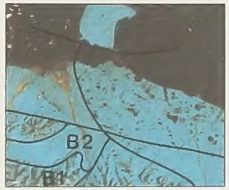


Ecoregions Portions of two ecoregions are shown on the oblique photo (left) and map (righ). The Coastal Plain Ecoregion (A) is a gently inclined surface which extends along the entire Yukon coast. Wet soils, tussocky and almost continuous sedge-trailing shrub plant communities, and a foggy and cool maritime climate prevail. In contrast, the Northern Mountains Ecoregion (B) is sparsely vegetated, rugged, and mantled by colluvial detritus.





Ecodistricts The Landsat image (right) shows parts of ecoregions A and B above divided into ecodistricts; the oblique photo (left) shows the boundary between two of them. Ecodistrict B1 is of angular limestone mountains which are mantled by rubbly debris and covered with a sparse alpine vegetation. Ecodistrict B2 consists of low, rounded hills of shale bedrock; vegetation is fairly continuous and consists of sedges and low shrubs.



Ecosections A part of ecodistrict B1 above is here divided into ecosections, shown on an oblique photo (left) and a conventional panchromatic air photo (right). Within each ecosection there is a distinct assemblage and range of soils, local landforms, plant communities, hillslope hydrology, bedrock and, by inference, micro-climate. As shown here, it is common to find geographically separate ecosections with the same ecological properties.

Data Provided by ELS

An Ecological Land Survey contains basic data organized along disciplinary lines. Data for each map unit commonly includes many of the following:

Landforms
- Major landforms (e.g. hills, plains, mountains)
- Local landforms (e.g. slopes, micro-relief)
- Elevation
- Thickness, texture and origin of surface materials
- Modifying process

Soils
- Depth, stoniness and texture
- Formation and development
- pH and fertility
- Permafrost and water regime

Vegetation
- Species and plant communities
- Plant form (e.g. trees, shrubs) and abundance
- Fire and other disturbances
- Regeneration

Rivers, Streams and Lakes
- Size and abundance
- Channel type and process
- Water quality and depth
- Shorelines (materials, form and process)

Fish and Wildlife
- Kinds of habitat and use by animals
- Actual and potential species

As well as basic data, an ELS typically includes descriptions and illustrations of each map unit. This information gives an overview of the ecosystem(s) and ecological relationships. Examples include:

- links between geology, soils and climate leading to distinctive patterns and regimes of streamflow
- relationships between present vegetation and wildlife, and the potential for managed biological productivity
- interaction of permafrost, terrain and vegetation to determine trafficability

An understanding of these processes is used to guide the interpretation of basic data in order to derive the uses of ELS data described elsewhere in this brochure.